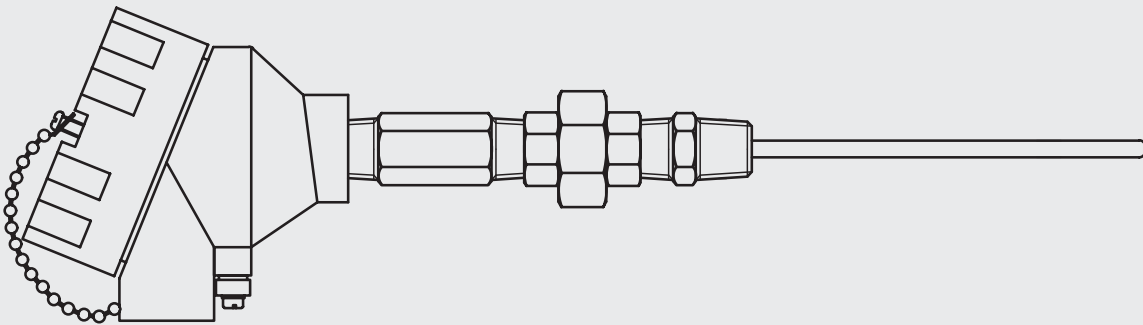


# Spring loaded thermocouple

FOR USE WITH THERMOWELLS

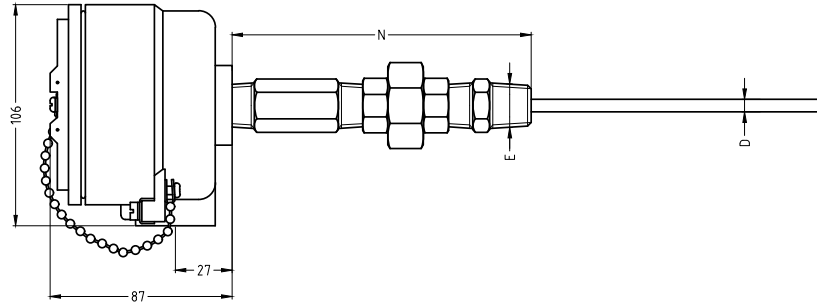
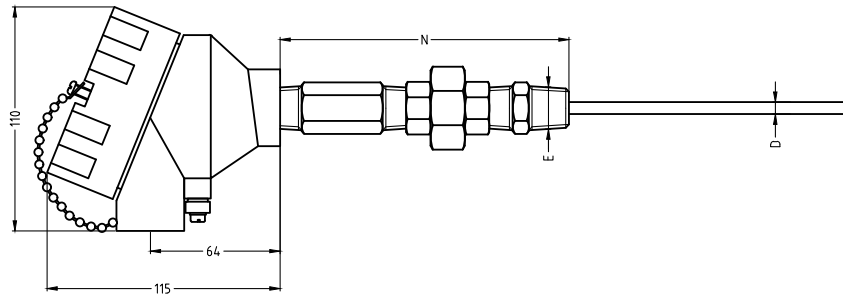
**S181-182**  
**CONFIGURATIONS**

**Ex d TC**



**RODAX**<sup>o</sup>  
new temperature solutions

Product series TCFB/FW

**S181****S182**

## Features assembly

The industrial spring loaded configuration guarantees a positive contact between the sensing part of the temperature probe and the bottom of the thermowell, thus reducing the response time. In order to calculate the correct element length, we need the Z-length: this is the total bore depth of the thermowell.

The assemblies can be delivered with an aluminium or stainless steel connection head combined with a high quality thermocouple element with MgO mineral insulated metal sheathed cable, providing excellent stability and reproducibility.  
Sensor diameters up to 12,7mm.

## Technical specification assembly

- Connection head aluminium (S181 & S182).
- Ambient temperature range assembly: -45/+80 °C; this can be limited depending on the materials applied or in case a temperature transmitter is used.
- IP-68 protection degree (body – cover) with silicone rubber O-ring. The assembly protection degree (IP-68) can be attained but depends on the use of correct cable gland(s) and on the correct mounting to thermowells.
- Cover: screw type with chain.
- Several sensor diameters and lengths are possible.
- Only to be used with RODAX flame arrestor Ex d approved.
- ATEX certificate DEKRA 11ATEX0198 X replaced by new certificate 18ATEX0060 X (No changes).
- IECEx certificate DEKRA 11.0035 X replaced by new certificate DEKRA 18.0032X (No changes).

**Table 1: Configuration**

**Connection head type**

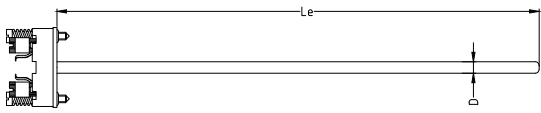
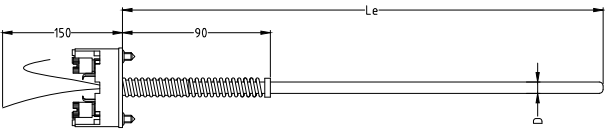
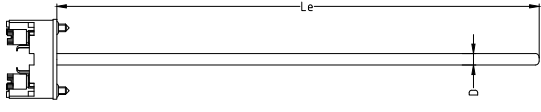
Choice between:

- Connection head types S181 & S182.

- Connection head supplied with O-ring in silicone rubber (between body and cover). Head supplied with external earth terminal and chain for cover.

	Conduit	Material	Coating	Colour
<b>S181</b>	81B1 1x conduit	Aluminium	Polyurethane spray on primer Corrosion category EN ISO 12944-2: C5-M	RAL7035 Light grey
<b>S182</b>	82B2 2x conduits	Aluminium	Polyurethane spray on primer Corrosion category EN ISO 12944-2: C5-M	RAL7035 Light grey

**Table 2: Measuring inserts main models**

	Terminal	Total spring	
<b>TCGC</b>	Ceramic spring loaded terminal block 2/4/6 or 8 terminals	10 mm  We recommend a spring loading of +/-5 mm	
<b>TCGA</b>	Hi-tech spring loaded thermoplast (moisture and shock proof) terminal block 2/4 or 6 terminals	10 mm  We recommend a spring loading of +/-5 mm	
<b>TCGF</b>	Spring loaded mounting plate with flying leads of 150 mm	10 mm  We recommend a spring loading of +/-5 mm	

**Table 3: Equipment for potentially explosive atmospheres**

### Certification

<b>A</b>	ATEX
<b>I</b>	IECEX
<b>G</b>	GOST-R

### Explosive atmosphere

<b>G</b>	Gas
<b>D</b>	Dust

**Table 4: Measuring inserts details**

### Details

- Thermocouple types: J/K/T/E/N/S/R/B
- Thermocouple standards: EN/IEC 60584 and/or ANSI MC96-1
- Minimum insulation resistance: 1000 MOhm at 500VDC, T<sub>amb</sub>=20 °C
- Conductors: thermocouple material
- Metal sheath: see table

### TC Type

<b>J</b>	<b>K</b>	<b>T</b>	<b>E</b>	<b>N</b>
Fe – CuNi	NiCr – NiAl	Cu – CuNi	NiCr – CuNi	NiCrSi – NiSi
±1.5 between -40 °C and 375 °C or ±0.004xT °C	±1.5 between -40 °C and 375 °C or ±0.004xT °C	±0.5 between -40 °C and 125 °C or ±0.004xT °C	±1.5 between -40 °C and 375 °C or ±0.004xT °C	±1.5 between -40 °C and 375 °C or ±0.004xT °C

### Colour code

<b>ANSI</b>	<b>IEC</b>	<b>Other</b>
ANSI – MC96-1	EN/IEC 60584-1	

### TC element

<b>S</b>	<b>D</b>	<b>T</b>
Single thermocouple	Dual thermocouple	Triple thermocouple

### Diameter ØD

<b>D3</b>	<b>D3,2</b>	<b>D4,5</b>	<b>D4,8</b>	<b>D6</b>	<b>D6,35</b>	<b>D8</b>	<b>D9,53</b>	<b>D12,7</b>	<b>Other diameters on request</b>
3,0 mm	3,2 mm	4,5 mm	4,8 mm	6,0 mm	6,35 mm	8,0 mm	9,53 mm	12,7 mm	

### Sheath material

<b>M2102</b>	<b>M2107</b>	<b>M2110</b>	<b>M0601</b>	<b>M0701</b>	<b>M0704</b>	<b>M0809</b>
SS304	SS316 Standard for TC J/T	SS310	Inconel 600 Standard for TC K	Alloy 800H	Alloy 825	Hastelloy X

## Hot junction

<b>I</b>	Individually isolated	Hot junction electrically isolated from and shielded by the sheath.
<b>CI</b>	Commonly isolated	Multiple hot junctions joined to one hot junction electrically isolated from and shielded by the sheath.
<b>DI</b>	Dually isolated	Hot junction electrically isolated from and shielded by the sheath. For dual and triple: all circuits isolated from each other and from the sheath.
<b>G</b>	Grounded	Hot junction welded to the sheath.

**Table 5: Extension details (E and N)**

## Details

Nipple-union-nipple extension with minimum length N of 110 mm in stainless steel SS316L. In order to achieve longer lengths, pipe nipples will be used instead of hex nipples.

### Extension connection (E)

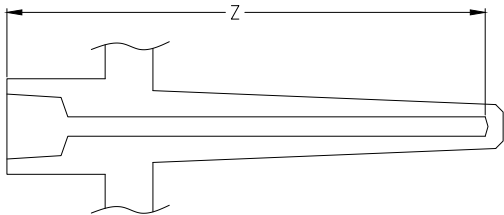
<b>E405</b>		<b>Other dimensions on request</b>
1/2"NPT		

### Extension length (N)

<b>N135</b>	<b>N160</b>	<b>Other lengths on request</b>
135 mm	160 mm	
with hex nipples + flame arrestor	with pipe nipples + flame arrestor	

## Total bore depth thermowell

Definition total bore depth thermowell (Z) in mm below.

	<b>Z.....</b>
	..... mm

**Table 6: Connection head details**

## Connection head single/double conduits (SC/DC)

<b>SC173</b>	<b>SC405</b>	<b>DC173</b>	<b>DC405</b>
1X M20x1.5	1X 1/2"NPT	2x M20x1.5	2X 1/2"NPT

**Table 7: Connection head accessories**

## Available options

- **Option 1: For SC and DC connection heads: Cable gland(s) only**

If required, a cable gland can be supplied; please use the letter 'CG' (cable gland) followed by the material of the cable gland and used cable diameter. Specification see below table.

The offered cable glands are II2 G Ex d/e IIC Gb and II 2D Ex tb IIIC Db IP66 certified and can be combined with configured products in this datasheet.

For SC heads, only option 'one cable gland' is possible. For DC heads, both one and two cable glands are possible.

- **Option 2: For DC connection heads: One conduit plugged**

Please use the letter 'P' (plug) followed by the material of the plug, see below table. The remaining conduits stay open.

- **Option 3: For DC connection heads: Cable gland + one conduit plugged**

Please use the combination 'PCG' (plug cable gland) followed by the material of the plug and cable gland, see below table.

		Option 1	Option 2	Option 3
<b>Material</b>	Brass	<b>CGM0200</b>	<b>PM0200</b>	<b>PCGM0200</b>
	Nickel plated brass	<b>CGM0210</b>	<b>PM0210</b>	<b>PCGM0210</b>
	Stainless steel SS316	<b>CGM2107</b>	<b>PM2107</b>	<b>PCGM2107</b>
		In case of SC, plug and gland material are identical.	In case of SC, plug and gland material are identical.	In case of SC, plug and gland material are identical.
<b>Cable diameter for EPDM rubber</b>	4 - 7 mm	<b>D5</b>		<b>D5</b>
	7 - 9,5 mm	<b>D8</b>		<b>D8</b>
	9 - 12 mm	<b>D10</b>		<b>D10</b>
		Other on request		Other on request
<b>Glands N°</b>	One cable gland	<b>N1</b>		
	Two cable glands	<b>N2</b>		

**Table 8: Certification possibilities**

## Certificates

Following tests and certificates are possible and are either done in-house or done by an external party.

Code	Certificates
<b>Q04210</b>	Functional test report sensor
<b>Q04230</b>	Calibration report (measuring points to be indicated) E.g. 100/200 °C
<b>Q05220</b>	Calibration report by accredited calibration lab retraceable (measuring points to be indicated)
<b>Q05230</b>	Calibration report by accredited calibration lab ISO/IEC 17025 (BELAC) (measuring points to be indicated)
<b>Q02040</b>	Test report EN10204-2.2
<b>Q04250</b>	Transmitter programming. Range and burn-out settings to be indicated

## Addenda




### Thermal data related to product series TCFB/FW

Replacement for Old S18-TCCB/S18-TCRB/S18-TCTP 100 % identical, no changes.

The maximum process temperature  $T_p$  (in °C) and the relation to the temperature class is as follows:

<b>Maximum process temperature <math>T_p</math> (°C)</b>	75	90	125	190	285	435	>435
<b>Temperature class (°C)</b>	T6	T5	T4	T3	T2	T1	$T_p+10$
<b>Maximum surface temperature T of the Assembly (°C)</b>	85	100	135	200	300	450	$T_p+10$

### Certificates for product series TCWI

Certification	Old certificate n° (VOID)	Certificate n°
<b>ATEX 2014/34/EU</b> 	ATEX EU-type examination certificate 11ATEX0198 X	ATEX EU-type examination certificate 18ATEX0060 X
<b>IECEX 02</b> 	IECEX DEK 11.0035 X	IECEX DEK 18.0032 X
<b>GOST-R</b> 	GOST EAC RU C-BE.ГБ05B.00211	

## HOW TO ORDER (example)

Code		Example	Your code
<b>Configuration</b>	See table 1	S181	
<b>Main model</b>	See table 2	KGA	
<b>Certification</b>	See table 3	A	
<b>Explosion atmosphere</b>	See table 3	G	
<b>TC type</b>	See table 4	K	
<b>Colour code</b>	See table 4	IEC	
<b>TC element</b>	See table 4	D	
<b>Diameter ØD</b>	See table 4	D6	
<b>Sheath material</b>	See table 4	M0601	
<b>Hot junction</b>	See table 4	I	
<b>Extension connection</b>	See table 5	E405	
<b>Extension length</b>	See table 5	N135	
<b>Total bore depth thermowell</b>	See table 5	Z165	
<b>Connection head SC/DC</b>	See table 6	SC173	
<b>Connection head accessories</b>	See table 7	CGM0200D5N2	

Ordering code example:

S181 KGA A G K IEC D D6 M0601 I E405 N135 Z165 SC173 CGM0200D5N2

**For all options: please contact Rodax**



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**S181-Exd-TC GB 201903**